35 U.S.C. § 103

The Office Action rejected claims 13-18 under 35 U.S.C. § 103 as allegedly being unpatentable over Larson et al. U.S. Patent 5,206,788 ("Larson") in view of Desu et al. U.S. Patent 5,817,170 ("Desu"). Applicants respectfully traverse those rejections for at least the following reasons.

Among other things, the method of claim 13 includes:

"*forming an upper seed layer on the ferroelectric layer.*"

As explained in the specification, during a subsequent annealing step, the upper **seed layer** becomes crystallized before the ferroelectric layer does (page 8, lines 18-20; page 9, lines 12-14; page 14, lines 7-8), to thereby act as a **seed layer** (page 16, lines 8-9) for the subsequent crystallization of the ferroelectric layer. The upper and lower seed layers together insure that crystallization proceeds uniformly from the **upper and lower surfaces** of the ferroelectric layer toward the middle (page 9, lines 14-15; page 13, lines 19-21; page 14, lines 9-10; page 16, lines 12-14), such that characteristics of the upper and lower interfaces of the ferroelectric layer match each other (page 4, lines 5-7; page 6, lines 4-5; page 8, lines 15-17; page 9, lines 1-2; page 14, lines 1-2, 10-11; page 16, lines 14-16). This prevents the so-called imprint phenomenon caused by a difference in characteristics between: (A) an upper interface between the upper metal layer and the ferroelectric layer, and (B) a lower interface

between the lower metal layer and the ferroelectric layer (page 3, lines 3-6; page 6, lines 4-7; page 8, lines 14-15; page 11, lines 2-3; page 16, lines 9-10).

Applicants respectfully submit that neither Larson nor Desu discloses forming any upper seed layer.

The Office Action admits that Larson does not disclose an upper seed layer. However, the Office Action states that Desu discloses "forming an upper seed layer (40)."

Applicants respectfully disagree.

Reference numeral (40) in Desu designates a "**capping** layer," (see, e.g., col. 4, lines 52-53) not an upper **seed** layer. Indeed, Desu carefully distinguishes between a **seeding layer** (layer (20)) and a capping layer (layer (40)). Desu teaches that the **capping layer** (40) (which is disclosed to be lead oxide) is provided to prevent loss of PB content in the underlying PZT film during post-deposition annealing (see, e.g., col. 2, lines 40-49, 64-65). Desu does not disclose that the capping layer (40) performs any seeding for the formation of the perovskite structure of the underlying PZT film (30). This should be contrasted to the detailed discussion in Desu of the seeding operation of the (lower) **seeding layer** (20) (see, e.g., col. 6, lines 17-39).

Therefore, for at least the foregoing reasons, it is not possible for any combination of Larson and Desu to produce the method of claim 13. Accordingly, it is respectfully requested that the rejection of claim 13 based on Larson and Desu be withdrawn.

Claims 14-18 dependent from claim 13 are deemed to be allowable for at least similar reasons, and for the following additional reasons.

Claim 15

Among other things, the method of claim 15 includes a feature of forming lower and upper seed layers using a material ***having a crystallization temperature lower than that of a material for forming the ferroelectric layer***.

The Office Action stated that Desu discloses such a feature.

Applicants respectfully disagree. Indeed, the Office Action has failed to cite any Figure or text anywhere in Desu where it is alleged that such a feature is disclosed.

Applicants respectfully request that the Examiner either provide a citation to something in Desu where such a feature is allegedly disclosed, or that the Examiner withdraw the rejection of claim 15.

Claim 16

Among other things, the method of claim 16 includes a feature of forming lower and upper seed layers using a ferroelectric material ***having a lattice constant similar to that of a material for forming the ferroelectric layer***.

The Office Action stated that Desu discloses such a feature.

Applicants respectfully disagree. Indeed, the Office Action has failed to cite any Figure or text anywhere in Desu where it is alleged that such a feature is disclosed.

Applicants respectfully request that the Examiner either provide a citation to something in Desu where such a feature is allegedly disclosed, or that the Examiner withdraw the rejection of claim 16.

Claims 19-20

The Examiner rejected claims 19-20 under 35 U.S.C. § 103 as allegedly being unpatentable over Larson and Desu in view Hsu et al. U.S. Patent 6,048,738 ("Hsu"). The Examiner has cited Hsu solely for the switching element noted as missing in Larson and Desu. However, Applicants respectfully submit that Hsu fails to cure the other defects in Larson and Desu discussed above with respect to claim 13 from which claims 19 and 20 depend. Accordingly, it is respectfully submitted that claims 19 and 20 are patentable over any combination of Larson, Desu and Hsu.

CONCLUSION

In view of the foregoing explanations, Applicants respectfully request that the Examiner reconsider and reexamine the present application, allow claims 13-20, and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Kenneth D. Springer (Reg. No. 39,843) at (703) 715-0870 to discuss these matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No.

50-0238 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17, particularly extension of time fees.

Respectfully submitted,

VOLENTINE FRANCOS, P.L.L.C.

Date: 23 July 2003

By: _____
Kenneth D. Springer
Registration No. 39,843

VOLENTINE FRANCOS, P.L.L.C.
12200 Sunrise Valley Drive, Suite 150
Reston, Virginia 20191
Telephone No.: (703) 715-0870
Facsimile No.: (703) 715-0877